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Tutorial: Boosting requirements analysis and validation skills through feedback-enabled semantic prototyping

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http://re15.org/pages/conference/tutorials/#T01

Abstract: Learning requirements analysis and validation is very hard. Experienced requirements engineers and business analysts manage to mentally picture (i.e. simulate) the future information system in their mind while analyzing and validation requirements. This skill is very hard to achieve by junior requirements engineers. This tutorial presents a novel, award winning and scientifically proven method [1-17] that boosts the learning achievements in requirements analysis and validation by means of feedback-enabled rapid prototyping allowing to "learn by experiencing" by means of:

1. visualizing solution-oriented requirements which enables semantic conformance checking with domain experts by serving as a **simulation instrument** to communicate scenarios with users in a fast and easy way
2. moving the testing of a prospective system into the requirements engineering phase;
3. additionally, allowing less experienced analysts detecting own specification errors such as conflicting, wrongly captured or missing requirements, etc.

The learning perspective is additionally enhanced by providing **automated cognitive feedback** linking prototype-based test results into their causes in formalized requirements. This tutorial is targeted towards a broad audience: faculty staff, professional industry educators, practitioners, researchers, students. Participants are welcome however not required to bring any devices themselves. The material used for the course will be available to the participants as a free download. All attendees will get a free USB with software, examples and the material used during the tutorial.

Length: full day

Outline of topics:

Part 1 (Morning): Formalizing requirements through conceptual models

- Topic 1: modeling & simulation of requirements
  Bird's eye view on the tutorial including a demo of the software that will be used
  - Challenges in requirements analysis specifically from teaching/learning perspective: This part of the tutorial reviews the different factors that affect the formalization process of requirements in a negative way.
  - Hands on: To start this topic, the attendees will be challenged on their model reading skills by means of a small quiz (paper-based). First attendees will be asked to manually inspect a small erroneous

model and answer a few true/false questions about a model with respect to its semantic conformance to a few business requirements.

- Topic 2: Formalizing structural aspects of a system into conceptual models
- Hands on session 1: exercising by means of a small requirement statement
- Topic 3: Formalizing dynamic (behavioral) aspects of a system into conceptual models
- Hands on session 2: exercising by means of a small requirement statement
- Topic 4: Consistency checking & tool support

Part 2 (Afternoon): Requirements validation through feedback-enabled semantic prototyping

- Topic 1: The impact of prototype-based simulation & feedback on the learning process of requirements analysis/validation
    - This part of the tutorial reviews the theory on simulation and feedback and their impact on the requirements formalization process
- Topic 2: Executable domain models with UML.
    - What makes it difficult to simulate UML models? In this session we review different technologies available to simulate domain models.
- Hands on session 1: exercising the simulation through a simple model
- Topic 3: Feedback enabled simulation.
    - Principles of setting up automated feedback
    - Interactive Demo on of model validation using automated feedback based in the model used for Topic 1: Based on their wrong answers for the quiz under topic 1, attendants can suggest tests which will be executed by the presenter. In this way we can demonstrate how the feedback-enabled application helps a learner to understand the model better.
    - Scientific results: In this part we present the findings from our research on experimental validation of the demonstrated method

Presenters' Bios

Monique Snoeck holds a PhD in computer science from the KU Leuven, Belgium. She is full professor in the Department of Decision Sciences and Information Management of the Faculty of Economics and Business of the KU Leuven and visiting professor at the University of Namur (UNamur). Her research focuses on requirements engineering, software architecture, model-driven engineering and business process management, conceptual modeling. She is an author of more than 150 publications. Her book titled "Enterprise Information Systems Engineering - The MERODE Approach" was published in Springer. She has presented numerous industrial tutorials in the past through the Belgian organization SAI (www.sai.be) and at former editions of the TOOLS conferences and the CAiSE conference.

Gayane Sedrakyan is a PhD researcher at KU Leuven, Belgium. She got master degrees in Management Information Systems (KU Leuven) and Computer and Information Science (American University of Armenia). She received an award in the nomination of “Best master student in Information Technologies (2007)” by the President of Armenia and Synopsys corporation. Gayane has 8 years of programming experience. Based on MERODE methodology she has been developing a feedback-enabled semantic prototyper to facilitate the process of requirements analysis and modeling. Her research has resulted in articles in top journals while also being nominated for educational award within KU Leuven.

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